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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,580	03/09/2001	Yoshiki Nakagawa	1581/00234	2233

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EXAMINER

ZALUKAEVA, TATYANA

ART UNIT	PAPER NUMBER
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1713

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DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,580

Applicant(s)

NAKAGAWA ET AL.

Examiner

Tatyana Zalukaeva

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite because of the term "obtainable" recited in claims 1, 4, , 9, 13, 14-16, 33, because an undue experimentation is involved to determine boundaries of protection. This rationale is applicable to polymer "obtainable" by a stated process because any variation in any parameter within the scope of the claimed process would change the polymer produced. One who made or used a polymer made by a process other than the process cited in the claim would have to produce a polymer using all possible parameters within the scope of the claim, and then extensively analyze each product to determine if this polymer was obtainable by a process within the scope of the claimed process. Consult *Ex parte Tanksley*, 26 USPQ 2d 1389.

The recited structures [I], as per claim 1, [II], as per claim 29, and [III] as per claim 32 are not defined.

Claim Objections

3. Claims 19-21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim 5, claims 22-24 fail to further limit the subject matter of claims 6, 7 and 8 respectively. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1-8, 10-13, 17-24, 29, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Matyjaszewski et al (U.S. 5,763,548).

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Matyjaszewski discloses process of **living atom (or group) transfer radical polymerization** for the synthesis of novel homopolymer or a **block or graft copolymer**, optionally **containing at least one polar group**, with well defined molecular architecture and narrow polydispersity index, in the presence of an initiating system comprising (i) an initiator having a radically transferrable atom or group, (ii) a transition metal compound, and (iii) a ligand; the present invention is also directed to the synthesis of a **macromolecule having at least two halogen groups which can be used as a macroinitiator component (i) to subsequently form a block or graft copolymer by an atom or group transfer radical polymerization process**; the present invention is also directed to a process of atom or group transfer radical polymerization for the synthesis of a **branched or hyperbranched polymer**; in addition, the present invention is directed to a process of atom or group transfer radical polymerization for the synthesis of a macroinitiator (macromer) which can subsequently be used to produce a block or graft copolymer (see abstract). This reads on the limitations of the instant claims 1, 4, 5, 13, 19-21, 29.

FIG. 2 shows kinetic plots and molecular weight behavior for the polymerization of N butylacrylate by atom transfer radical polymerization. FIG. 3 shows kinetic and molecular weight behavior plots for the polymerization of acrylonitrile by atom transfer radical polymerization. Macromonomer will have M_n of at least 500. (column 7, lines 15-17). This meets the limitations of claim 167.

According to Matyjaszewski preferred monomers include (but not limited to) **styrene**, p-chloromethylstyrene, vinyl chloroacetate, **acrylate and methacrylate esters**

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of C1 -C20 alcohols, isobutene, 2-(2-bromopropionoxy) ethyl acrylate, acrylonitrile, and methacrylonitrile (column 9, lines 8-12). This meets the limitations of the instant claims 2, 3, 10, 11, 12.

The transition metal catalysts are used for polymerization, including but not limited to iron, nickel, ruthenium and copper, wherein copper is a preferred metal (column 10, lines 64). This meets the limitations of the instant claims 6-8, 22-24

Particular scheme for producing branched polymers in the presence of copper based catalyst is presented in column 22, lines 52-65, column 23, lines 1-35). Macromonomers usually have low polydispersity index, such as 1.6 (column 23, line 62) for macromonomer of butyl acrylate-2,2-bromopropionoxy ethyl acrylate, which is used for ATRP of styrene. This reads on the limitations of claim 18.

6. Claims 1-6, 9-13, 17, 19-22, 24-36 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0261 942.

EP'942 discloses a branched polymer obtained by polymerization of vinyl polymer, which is in turn made by a radical polymerization as a macromonomer having one polymerizable double bond per molecule at the terminal, wherein the monomeric units comprise acrylates, acrylic acid, styrene, acrylonitriles, etc. The formula of a macromonomer is presented on page 2, lines 30-55 (see also abstract). Most preferred for commercial applications macromonomers have 100-500 units (page 3, lines 20-25). The concentration of a macromonomer in a composition is at least about 15 mol%. (page 3, lines 60-65). The macromonomer composition of EP'942 is prepared by

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polymerization process employing specific cobalt chelates as chain transfer agents (page 4, lines 10-15). The polymerization to obtain a macromonomer is carried out in a presence of conventional free radical initiator employing any known methods of polymerization (page 6, lines 20-35).

The macromonomers of EP'942 are useful to produce graft polymers which are useful in coating and molding resins , etc. (page 12, lines 25-37).

7. Claims 1, 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 50-150,793.

JP'793 discloses comb type block copolymer prepared by copolymerising reaction products of polyalkyl methacrylate and unsaturated acid chloride(s) with hydrophilic monomers. Such butylmethacrylate was emulsified and in the presence of H₂O₂. and reacted with methacrylchloride. The reaction product and hydroxyethylmethacrylate were dissolved in 14 ml dimethylformamide, and polymerised in hexane transparent cast film copolymer.(see abstract).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 13 –16, 25-28, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matyjaszewski

Although Matyjaszewski provides the macromonomers having functional groups as per instant claims he does not specify how those monomers are obtained, although generically teaches polymer analogous reactions, which lead to the terminal functional macromers.

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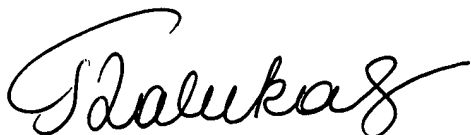
However, a person skilled in the art would have found it obvious to employ conventional methods of polymer analogous modifications in order to obtain the macromonomers identified by Matyjaszewski. Furthermore, it is settled by the courts that a "new" process may still be obvious even when considered as a whole, notwithstanding that specific starting material or resulting product or both or the method of their making is not found in the prior art, In re Durden, JR (226 USPQ 359 (CAFC 1985

12. Other prior art references cited in PTOL-892 show the state of art in living polymerization and synthesis of macromonomers.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (703) 308-8819. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (703) 308-2450. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.


08/02/02

Tatyana Zalukaeva
Examiner
Art Unit 1713